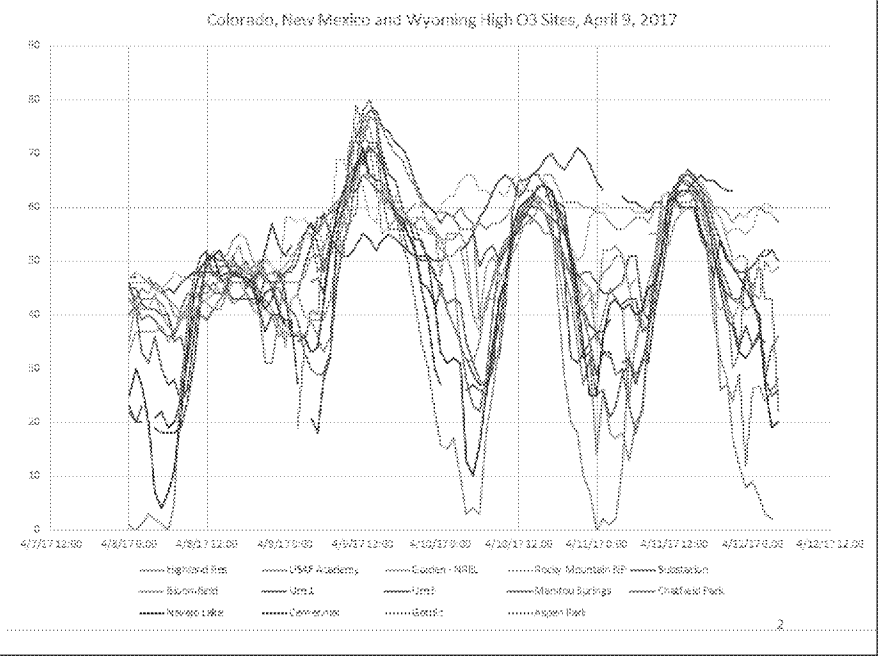
SI Workgroup Call: April 18, 2017

April 18: 9 am PDT, 10 am MDT, noon EST
Call In Code: Conference Line/Code / Ex. 6

1. Plots for April 9, 2017 in NM and CO: plots from Payton (EPA), Petropavlovskikh (NOAA), Landes (CDPHE) and Pierce (NOAA)
2. For New Hampshire March 17-18, See PPT from Brad Pierce:
   ftp://ftp.ssec.wisc.edu/pub/raqms/SI_workgroup/SI_WG_March_18_2017_Mt_Washington_RAQMS.pptx

April 9, 2017 NM and CO

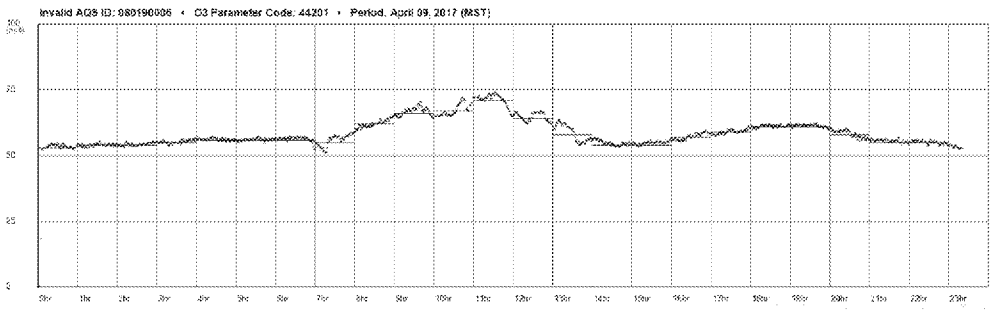
Hourly ozone reached 78 to 80 ppb at a number of Colorado monitoring sites mid-day on Sunday, April 9. Highest was Chatfield Park, South Denver, with 80 ppb at 2:00 pm MDT. The Colorado Springs monitors (Manitou Springs and USAF Academy) peaked at 77 and 78 ppb, but had the broadest ozone peaks, so exceeded the 8-hour standard with 74 and 73 ppb. None of the other monitors had 8-hour averages over 70 ppb



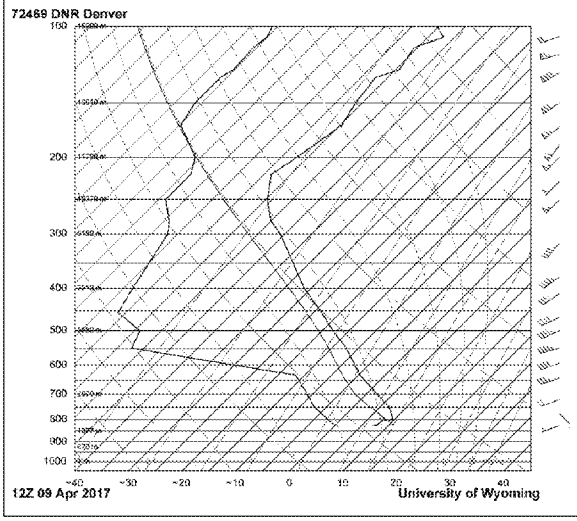
Colorado's 12,500 foot Mines Peak monitor, 47 miles due west of Denver, had a 1-minute peak of about 75 ppb at 12:30 pm MDT, although that should be used with caution, as snow prevents regular maintenance at that site in winter

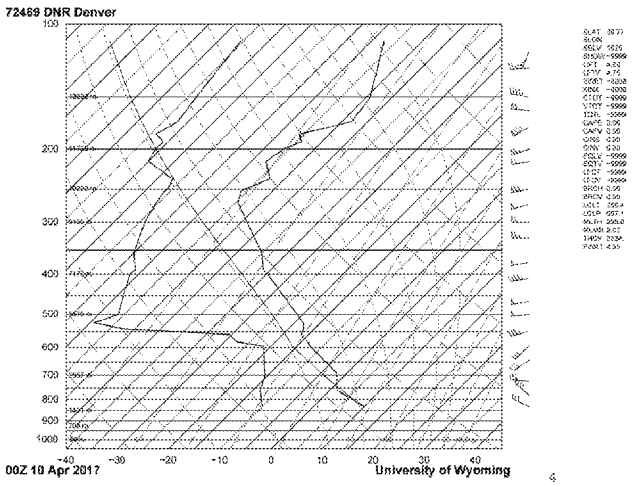
Raw minute data from polling system

These are real time data compiled at the time they were reported. These data have not been validated, corrected, and may not consider validation flags.

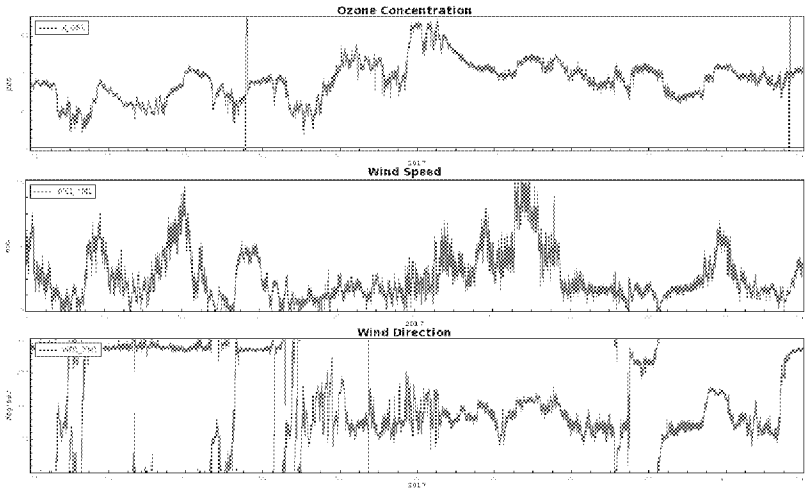


Denver Soundings on April 9 show a large dry air mass above about 3000 m

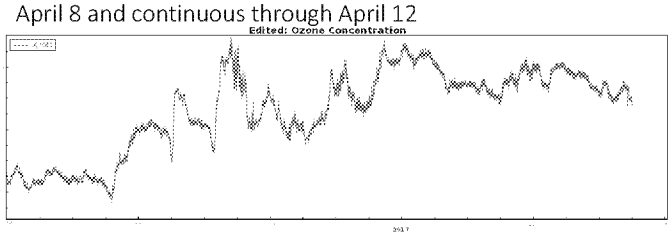




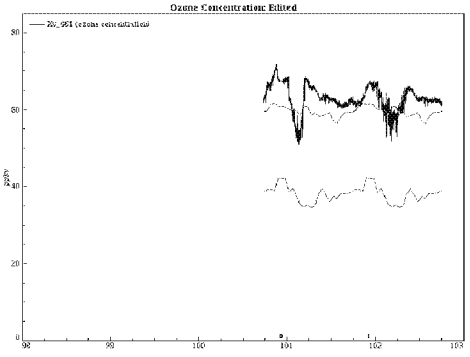
Elevated surface ozone at THD back on April 6th (NOAA).



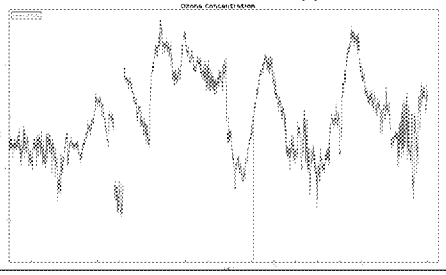
Tundra (3500 m) station in Colorado: Elevated ozone events on April 9 and later are seen in this plot (top of the graph is at 75 ppbv, each tick is 2.5 ppbv), which starts on April 8 and continuous through April 12



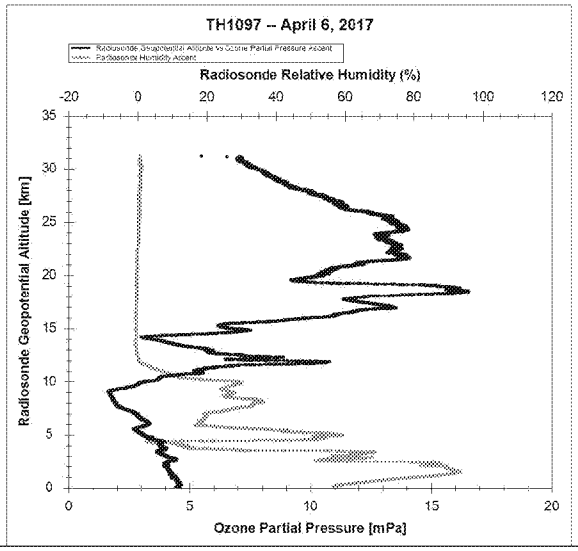
Niwot Ridge (3000 m) station and it shows elevated ozone on April 11 and 12 - black line above standard deviation envelop shown in green



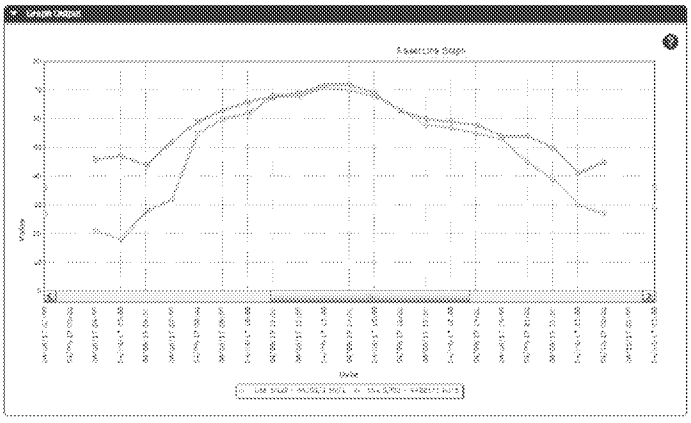
Ozone in the Foothills at Table Mountain facility (North of Boulder) also shows elevated ozone events (top of the graph is 70 ppbv, tick is 2.5 ppbv), although ozone levels at this station are not above 70 ppbv

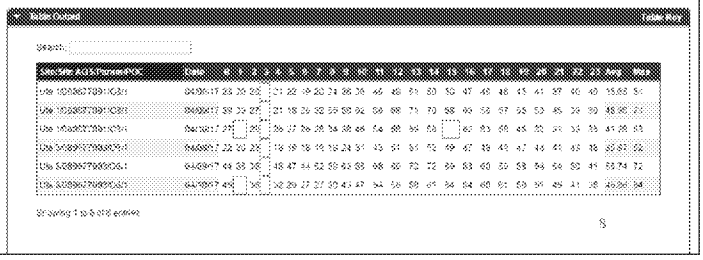


Ozone-sonde profile launched on April 6th, with dry air (pink) in layer between 3 and 4 km, and somewhat dry air at 6-7 km altitude. (NOAA)

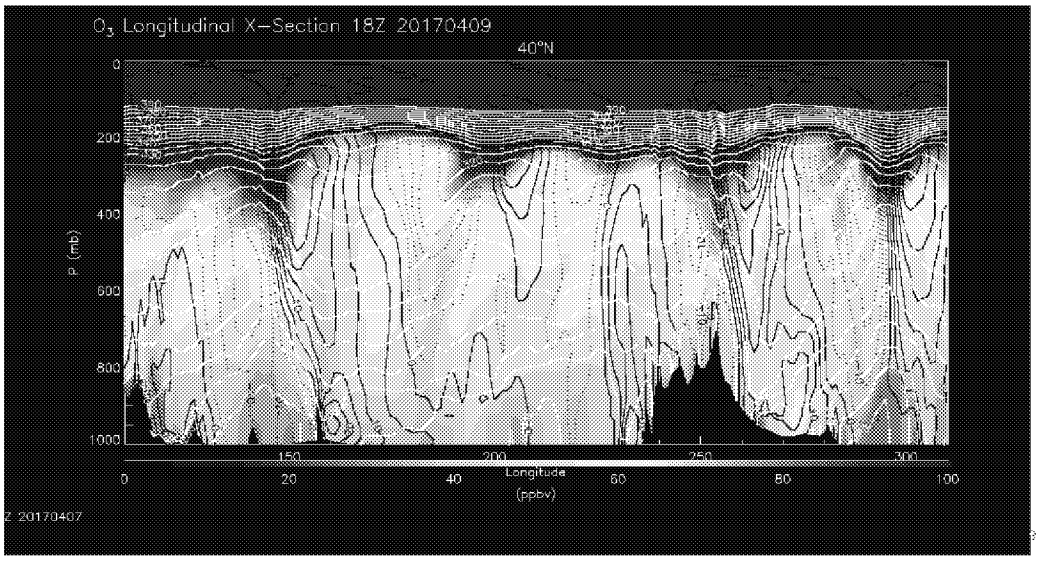


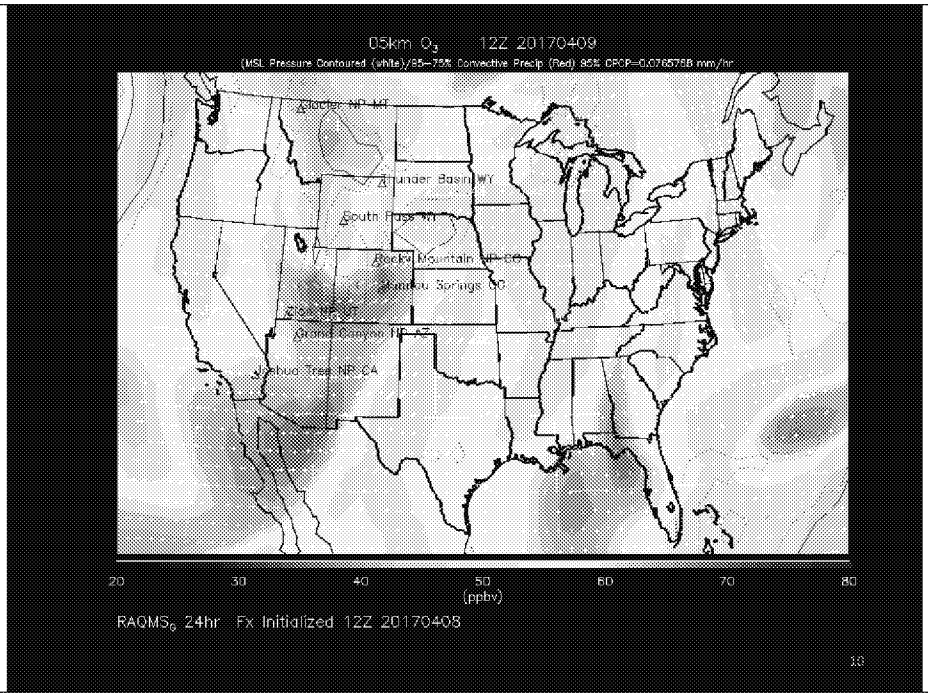
CDPHE: Along with the elevated concentrations in the Front Range region we saw some pretty impressive readings (for early April) at the Southern Ute Reservation monitors. Both peaked at or near 70 ppb for 3-4 hours which prompted us to issue an Air Quality Health Advisory for La Plata county. Interestingly the nearby higher-elevation Mesa Verde NP monitor lagged about 7-10 ppb below the Ute monitors during that time period. Perhaps there was also an anthropogenic factor at play

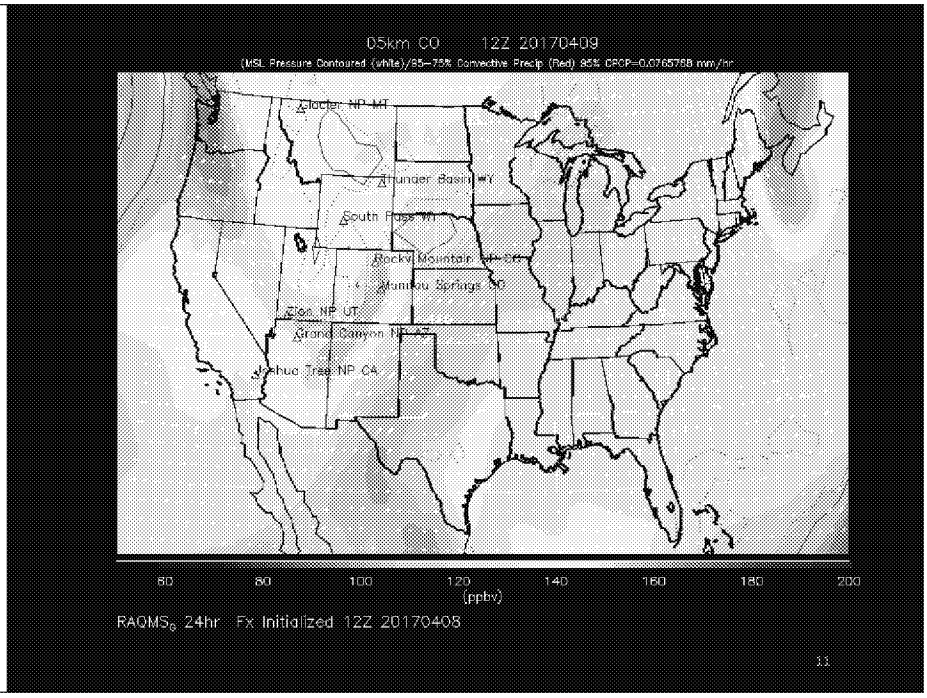


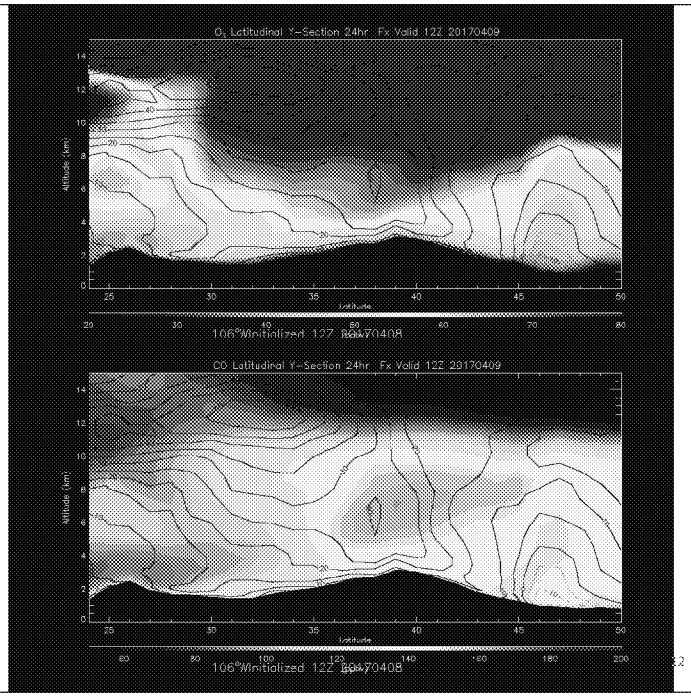


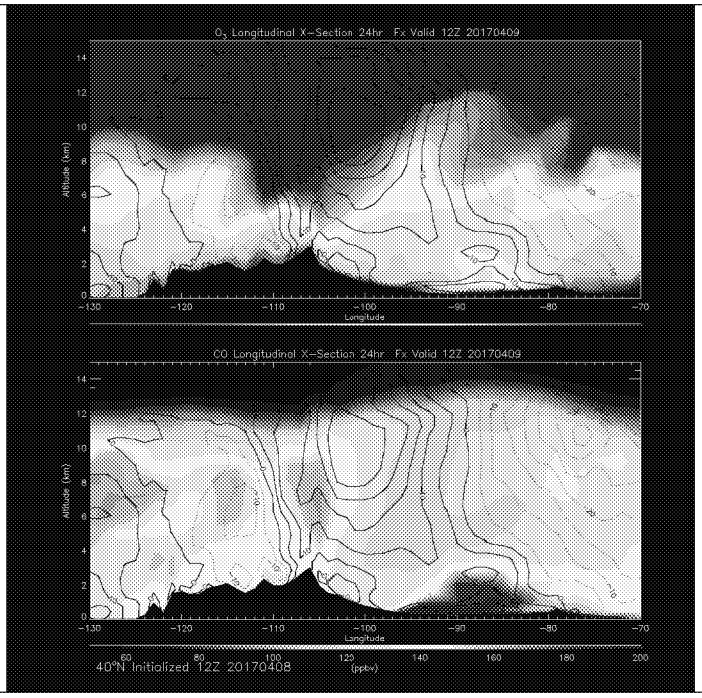
The RAQMS 40° N cross section (40° passes through Boulder, CO) shows an intrusion down to 400 mb over the Indian Peaks (255 °E Longitude), with down mixing east of the Rockies at 12:00 pm MDT.

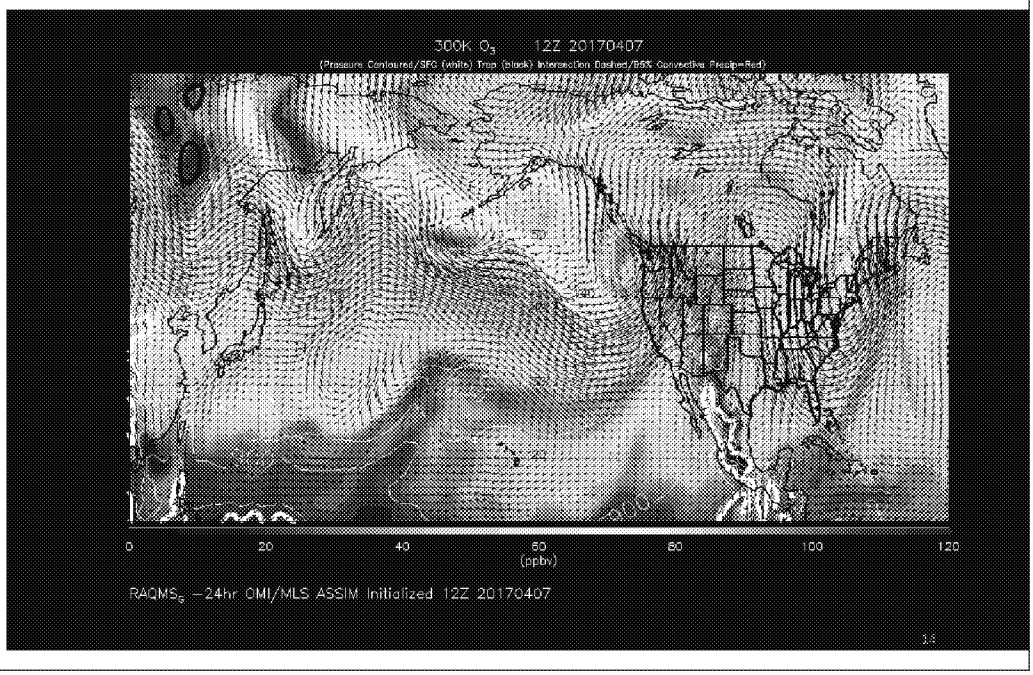


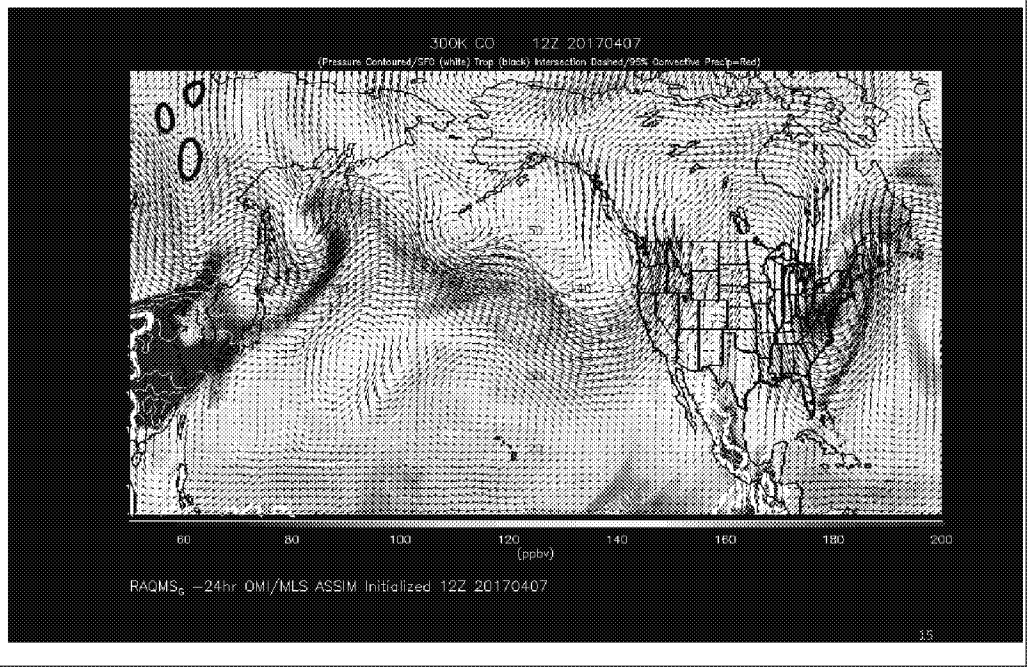

05km O_3 12Z 20170409
(MSL Pressure Contoured (white)/85–75% Convective Precip (Red) 85% CPCP=0.076578 mm/hr
Glacier NP MT
Wind River Range WY
South Pass WY
Rocky Mountain NP CO
Grand Canyon NP AZ
Sequoia NP CA
20
30
40
50
60
70
80
(ppbv)
RAQMS$_o$ 24hr Fx Initialized 12Z 20170408
18


05km CO 12Z 20170409
(MSL Pressure Contoured (white)/85–75% Convective Precip (Red) 85% CPOP=0.076576B mm/hr
Glacier NP MT
Thunder Basin WY
South Pass WY
Rocky Mountain NP CO
Mammoth Springs CO
Zion NP UT
Grand Canyon NP AZ
Joshua Tree NP CA
80
80
100
120
140
160
180
200
(ppbv)
RAQMS6 24hr Fx Initialized 12Z 20170408
11

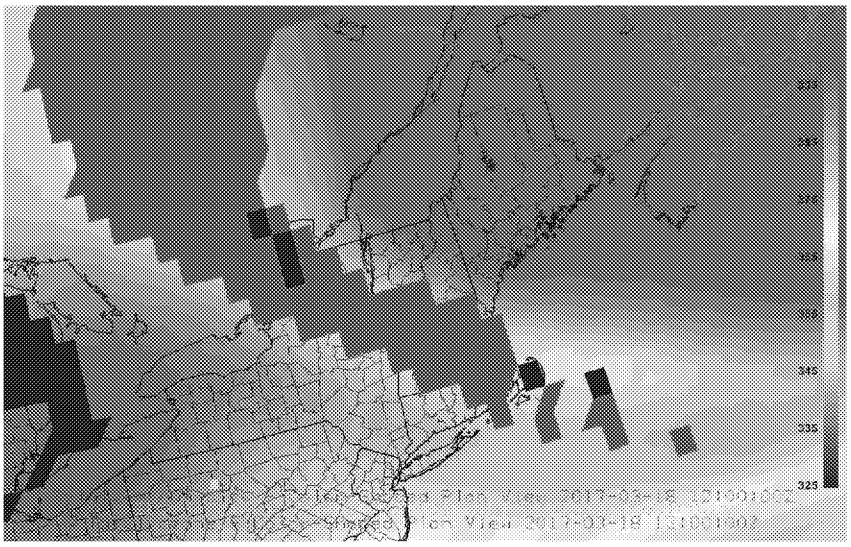

O_3 Latitudinal Y-Section 24hr Fx Valid 12Z 20170409
Altitude (km)
Latitude
106°Initialized 12Z 20170408
CO Latitudinal Y-Section 24hr Fx Valid 12Z 20170409
Altitude (km)
Latitude
106°Initialized 12Z 20170408


O_x Longitudinal X-Section 24hr Fx Valid 12Z 20170409
Altitude (km)
Longitude
CO Longitudinal X-Section 24hr Fx Valid 12Z 20170409
Altitude (km)
Longitude
40°N Initialized 12Z 20170408
(pptv)


300K O_3 12Z 20170407
(Pressure Contoured/SFC (white) Trop (black) Intersection Dashed/95% Convective Precip=Red)
0
20
40
60
80
100
120
(ppbv)
RAQMS$_G$ –24hr OMI/MLS ASSIM Initialized 12Z 20170407

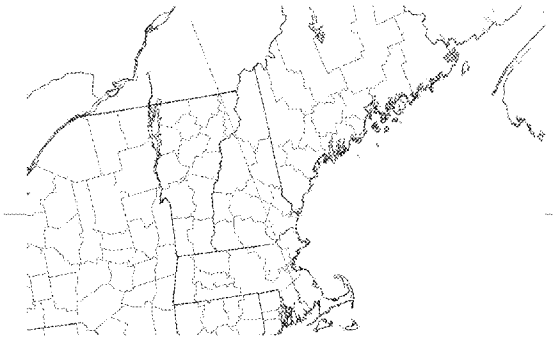

300K CO 12Z 20170407
(Pressure Contoured/SFC (white) Trop (black) Intersection Dashed/95% Convective Precip=Red)
60
80
100
120
140
160
180
200
(ppbv)
RAQMS$_{\delta}$ –24hr OMI/MLS ASSIM Initialized 12Z 20170407

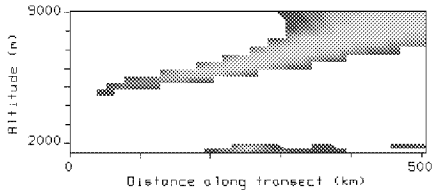
GFS 0.5 degree reanalysis for 12Z on 3/18 and it shows an ozone-rich column, 600 mb RH of less than 10% (in pink), and isentropic potential vorticity of around 1.0 (black pixels) in the same general area. Perhaps a mix of stratospheric air and some aged smoke?



Mt. Washington event, March 18, 2017

Vertical Cross Section of Isentropic Potential Vorticity (from Temperature & absvort)





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See next PPT at:
ftp://ftp.ssec.wisc.edu/pub/raqms/SI_workgroup/SI_WG_March_18_2017_Mt_Washington_RAQMS.pptx